What Is Claimed Is:

1. A process for introducing an asphalt into a synthetic fuel process, comprising the steps of :

introducing into the process an oil-in-water asphalt emulsion;

passing said asphalt emulsion to an atomizer;

adding to said atomizer a motivating gas to form an asphalt aerosol spray;

agitating a coal fines feed stream; and

injecting said aerosol spray into said agitated coal fines.

2. The process as claimed in Claim 1, wherein said asphalt emulsion comprises asphalt particles having an average diameter of about 5 microns or less.

3. The process as claimed in Claim 1, wherein said asphalt emulsion is anionic, cationic or non-ionic.

4. The process as claimed in Claim 3, wherein said emulsion is anionic.

5. The process as claimed in Claim 1, wherein said emulsion has a pH of about 7.0 or greater.

6. A process as claimed in Claim 1, wherein said introducing step comprises:

manufacturing said asphalt emulsion upstream of said atomizer as part of a continuous, integral process for introducing an asphalt into a synthetic fuel process.

7. The process as claimed in Claim 6, wherein said manufacturing step comprises the further steps of:

introducing into the process an asphalt;

creating a mixture of water and soap;

mixing in a mixer said asphalt and said water and soap mixture to create an asphalt-soapy water mixture by passing said asphalt and said water and soap mixture along a common directional vector into a high turbulence mixing zone; and

emulsifying said asphalt-soapy water mixture to create said asphalt emulsion.

8. A process as claimed in Claim 7, wherein said asphalt comprises no greater than about 50% by volume of said asphalt emulsion.

9. A process as claimed in Claim 8, wherein said asphalt comprises about 30 to 50% by volume of said asphalt emulsion.

10. The process as claimed in Claim 1, wherein said asphalt comprises no greater than about 50% by volume of said asphalt emulsion.

11. A process as claimed in Claim 10, wherein said asphalt comprises about 30 to 50% by volume of said asphalt emulsion.

12. The process as in Claim 1, wherein said gas is selected from the group consisting of air, carbon dioxide, nitrogen and mixtures thereof.

13. The process as in Claim 1, wherein the aerosol of said spray has a particle size of about 100 microns to about 500 microns.

14. The process as in Claim 1, wherein said aerosol spray is formed by mixing said asphalt emulsion and said motivating gas inside said atomizer.

15. The process as in Claim 1, wherein said atomizer injects said aerosol spray as a flat spray.

16. The process as in Claim 1, wherein said agitating step comprises mechanically agitating said coal fines.

17. The process as in Claim 16, wherein mechanical agitating involves continuously folding said coal fines.

18. The process as in Claim 1, wherein said aerosol spray is generally evenly distributed over said coal fines.

19. A process for spraying an asphalt emulsion onto coal in the manufacture of synthetic fuel, comprising the steps of:

introducing a motivating gas into an atomizer;

introducing an oil-in-water asphalt emulsion into said atomizer;

creating in said atomizer an atomized stream of emulsion and gas; and

spraying said atomized stream onto an agitated coal fines stream.

20. The process as in Claim 19, wherein said asphalt emulsion comprises asphalt particles having an average diameter of about 5 microns or less.

21. A process as claimed in Claim 19, wherein said emulsion is anionic, cationic or non-ionic.

22. A process as claimed in Claim 21, wherein said emulsion is anionic.

23. A process as claimed in Claim 19, wherein said emulsion has a pH of about 7.0 or greater.

24. A process as claimed in Claim 19, wherein said introducing step comprises:

manufacturing said asphalt emulsion upstream of said atomizer as part of a continuous, integral process for introducing an asphalt into a synthetic fuel process.

25. The process as claimed in Claim 24, wherein said manufacturing step comprises the further steps of:

introducing into the process an asphalt;

creating a mixture of water and soap;

mixing in a mixer said asphalt and said water and soap mixture to create an asphalt-soapy water mixture by passing said asphalt and said water and soap mixture along a common directional vector into a high turbulence mixing zone; and

emulsifying said asphalt-soapy water mixture to create said asphalt emulsion.

26. The process as claimed in Claim 25, wherein said asphalt comprises no greater than about 50% by volume of said asphalt emulsion.

27. A process as claimed in Claim 26, wherein said asphalt comprises about 30 to 50% by volume of said asphalt emulsion.

28. A process as claimed in Claim 19, wherein said asphalt comprises no greater than about 50% by volume of said asphalt emulsion.

29. A process as claimed in Claim 28, wherein said asphalt comprises about 30 to 50% by volume of said asphalt emulsion.

30. The process as in Claim 19, wherein said gas is selected from the group consisting of air, carbon dioxide, nitrogen and mixtures thereof.

31. The process as in Claim 19, wherein the aerosol of said spray has a particle size of about 100 microns to about 500 microns.

32. The process as in Claim 19, wherein said atomizer injects said aerosol spray as a flat spray.

33. The process as in Claim 19, wherein said agitated coal fines are mechanically agitated.

34. The process as in Claim 33, wherein said mechanically agitated coal fines involves continuously folding said coal fines.

35. The process as in Claim 19, wherein said atomized stream is generally evenly distributed over said coal fines.

36. A process for spraying an asphalt emulsion onto coal in the manufacture of synthetic fuel, comprising the steps of:

introducing into the process an asphalt binder;

creating a mixture of water and soap;

mixing said asphalt binder and said water and soap mixture to create an asphalt-soapy water mixture;

passing said asphalt-soapy water mixture to an emulsifier;

emulsifying said asphalt-soapy water mixture to create an oil-in-water asphalt emulsion;

passing said asphalt emulsion to an atomizer;

introducing a motivating gas stream into said atomizer;

creating in said atomizer an atomized stream of emulsion and air; and

spraying said atomized stream onto an agitated coal fines stream.

37. A mixer for mixing an asphalt emulsion and water, comprising:

a first flow chamber for receiving a first fluid at a first temperature;

a second flow chamber joined to said first flow chamber, said second flow chamber including a third flow chamber housed within said second flow chamber, said third flow chamber for receiving a second fluid at a second temperature, wherein said flow chambers extend along a common directional vector;

a fluid zone created by the area between said second and third flow chambers, wherein said first fluid is received within said fluid zone and said first fluid varies the temperature of said second fluid toward the temperature of said first fluid before mixing;

a mixing zone for mixing said first and second fluids to create a mixture; and

an outlet for passing said mixture from the mixer.

38. A mixer as claimed in Claim 37, wherein said second and third flow chambers are in a pipe in a pipe relationship.

39. The mixer as claimed in Claim 37, wherein said second flow chamber is positioned at an angle of less than 90 degrees relative to said first flow chamber, as measured along their respective longitudinal axes.

40. The mixer as claimed in Claim 37, wherein said first flow chamber and second flow chamber form the arms of a Y and said outlet forms the base of said Y.

41. The mixer as claimed in Claim 37, wherein said third flow chamber terminates in said mixing zone.

42. The mixer as claimed in Claim 37, wherein the end of said third flow chamber forms a non-perpendicular angle relative to the longitudinal axis of said third flow chamber.

43. The mixer as claimed in Claim 37, wherein said first flow chamber includes a baffle.

44. The mixer as claimed in Claim 43, wherein said baffle extends into said first flow chamber a depth substantially equal to the end of said third flow chamber in said mixing zone.

45. A mixer for an asphalt emulsion and a water-based mixture, comprising:

a first ingress having a baffle, wherein said ingress allows entry of a stream of soapy-water into said ingress;

a second ingress comprising a first pipe and a second pipe positioned in said first pipe, said pipe in a pipe structure forming a concentric longitudinal area between said pipes, said inner pipe allowing for the flow of an asphalt binder and said concentric area allowing for the passage of soapy-water about said inner pipe, wherein said first and second ingress extend along a common directional vector;

a junction area, wherein said first and second ingress meet to allow for the

mixing of said asphalt binder and said soapy-water; and

an egress which allows for flow of said mixture of soapy-water and asphalt mixture from said mixer.

46. The mixer as claimed in Claim 45, wherein said second ingress is positioned at an angle of less than 90 degrees relative to said first ingress, as measured along their respective longitudinal axes.

47. The mixer as claimed in Claim 45, wherein said first ingress and second ingress form the arms of a Y and said egress forms the base of said Y.

48. The mixer as claimed in Claim 45, wherein said second pipe terminates in said junction area.

49. The mixer as claimed in Claim 45, wherein the end of said second pipe forms a non-perpendicular angle relative to the longitudinal axis of said pipe.

50. The mixer as claimed in Claim 45, wherein said baffle extends into said first ingress a depth substantially equal to the end of said second pipe in said junction area.

51. A process for spraying an asphalt emulsion onto coal in the manufacture of synthetic fuel, comprising the steps of:

introducing into the process an asphalt binder;

creating a mixture of water and soap;

mixing said asphalt binder and said water and soap mixture to create an asphalt-soapy water mixture, wherein said water and soap mixture and said asphalt binder are introduced into a mixer along a common directional vector and said asphalt binder is progressively cooled in said mixer, prior to mixing with said water and soap mixture;

passing said asphalt-soapy water mixture to an emulsifier;

emulsifying said asphalt-soapy water mixture to create an oil-in-water asphalt emulsion;

continuously passing said asphalt emulsion to an atomizer;

introducing an air stream into said atomizer;

creating in said atomizer an atomized stream of emulsion and air; and

spraying said atomized stream onto an agitated coal fines stream.

52. A process for producing an asphalt emulsion for use in manufacturing synthetic fuel, comprising the steps of:

introducing into the process an asphalt binder;

creating a mixture of water and soap;

mixing said asphalt binder and said water and soap mixture to create an asphalt-soapy water mixture, wherein said water and soap mixture and said asphalt binder are introduced into a mixer along a common directional vector whereupon said asphalt binder is progressively and indirectly cooled by said water and soap mixture prior to mixing with said water and soap mixture; and

emulsifying said asphalt-soapy water mixture to create an oil-in-water asphalt emulsion capable of being continuously applied.

53. The process as claimed in Claim 52, wherein said progressive cooling comprises:

introducing said water and soap mixture to said mixer through a first flow chamber;

introducing said asphalt binder to said mixer through a second flow chamber; and

passing at least a portion of said water and soap mixture into a third flow chamber, said second flow chamber being housed within said third flow chamber, wherein said water and soap mixture progressively cools said asphalt binder as said asphalt binder flows through said second flow chamber.

54. The process as claimed in Claim 53, comprising the additional steps of passing said cooled asphalt binder and said water and soap mixture to a mixing zone and mixing said asphalt binder and said water and soap mixture.

55. A process for continuously applying an oil-in-water asphalt emulsion in a synthetic fuel process comprising the steps of:

creating an aerosol spray including a motivating gas and an asphalt emulsion; and

continuously spraying said aerosol spray into a source of agitated coal fines.